APPENDIX M
THEORETICAL DISTRIBUTION OF INTERMITTENT CHANNELS[1]

The following describes the modeling process for definition of intermittent stream channels. Model input includes soil permeability (based on texture and infiltration rate) and depth, and theoretical catchment area of 1st order streams. The initial stratification process used the following information and assumptions:

1. The NRCS Soil Survey of Coos County (USDA 1989) interpretation of permeability was used; where permeable is defined as infiltration of > 6 inches/hour. In the analysis area permeable soils are sandy soils derived from sedimentary rock.

2. The NRCS Soil Survey of Coos County description was used for soil depth; those chosen are where depth < 36 inches.

3. The flow recession was based on a summer dry period of 100 days.

4. The small headwater catchments were assumed to be unconfined.

5. It was assumed that all water from the ridgelines of small watersheds flows downhill at a uniform rate, defined by the hydraulic gradient.

6. Hillslopes into first order channels were assumed to average a 60% angle.

7. A unit hydraulic gradient of 0.452 ft./day was calculated from the average hillslope angle.

8. A transmissibility coefficient of 36 ft^3/ft/day was calculated from soil depth and permeability values.

9. A flow rate [Q] of 16.27 ft^3/day was calculated by use of Darcy's Law. Calculations were not adjusted for changes of water viscosity with temperature.

10. Small headwater watersheds were assumed to be circular.

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[1] This discussion on flood history was written by Dan Carpenter, Coss Bay district, BLM, for watershed analysis in the Myrtlewood Resource Area. The largest events in the last century occurred within the indicated timeframes. Estimated discharges were derived from a constructed flood frequency curve for USGS station 14325000, on the South Fork Coquille, near Powers, OR. This station was selected because it has a long period of record (80 years), and has similar high elevation areas subject to intermittent snow accumulation and melt. Differences in watershed area were equated by an area adjustment procedure. Estimated peak flow discharges may be higher (10-25%) than actual watershed runoff, because the watershed is further inland form the coast and precipitation patterns are different. Bankfull flow in the watershed is approximately 9900 cfs. These flooding discharges moderately to greatly exceeded the channel capacity and went overbank.

11. Matching flow recession and flow rate: 100 days x 16.27 ft/day = 1627 ft/season. Further, contributing area becomes (3.14 x 1627 ft/43560 ft/ac /2) = 95 ac. The area of a circle is calculated and then divided in half because only upstream areas contribute. Small catchments or watersheds up to this size may go dry with these assumptions.

12. A factor of safety of 25% then is applied to the computed (95 ac) value; therefore the maximum watershed size which may go dry under these assumptions is 76 ac.

Because there is currently no known rapid calculation tool in GIS that can derive watershed area, on Map A.34 (Appendix A) <u>all</u> first order stream channels (on highly permeable soils) are displayed as intermittent, rather than just those with watersheds of 76 ac or less.